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Notice of Allowability	Application No.	Applicant(s)	
	10/021,263	BELK ET AL.	
	Examiner	Art Unit	
	L. G. Lauchman	2877	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 12/07/2001.
2. ☒ The allowed claim(s) is/are 1-18.
3. ☒ The drawings filed on 07 December 2001 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).**
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|--|--|
| 1. <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date _____. |
| 3. <input checked="" type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date <u>12/07/01</u> | 7. <input type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other _____. |

DETAILED ACTION

Allowable Subject Matter

Claims 1-18 allowed.

The following is an examiner's statement of reasons for allowance:

As to Claim 1, the prior art of record taken along or in combination, fails to disclose or render obvious determining a hole image size indicative of a diameter of the image; determining a hole size indicative of a diameter of the hole; employing the hole image size and the hole size to calculate a second distance indicative of a distance between the light recording apparatus and the far side surface of the hole; and determining the depth of the hole by subtracting the first distance from the second distance, in combination with the rest of the limitations of the claim.

The dependent Claims 2-7 are allowed by virtue of their dependence upon Claim 1.

As to Claim 8, the prior art of record taken along or in combination, fails to disclose or render obvious determining a hole size indicative of a diameter of the hole; employing the hole image size and the hole size to calculate a second distance indicative of a distance between the reticle and the far side surface of the hole; and determining the depth of the hole by subtracting the first distance from the second distance, in combination with the rest of the limitations of the claim.

The dependent Claims 9-11 are allowed by virtue of their dependence upon Claim 8.

As to Claim 12, the prior art of record taken along or in combination, fails to disclose or render obvious the controller evaluating a size of the image, a distance between the surface of the workpiece and the light recording apparatus, and an actual size of the hole and determining the depth of the hole, in combination with the rest of the limitations of the claim.

The dependent Claim 13 is allowed by virtue of its dependence upon Claim 12.

As to Claim 14, the prior art of record taken along or in combination, fails to disclose or render obvious determining a hole image position indicative of a location of the light recording apparatus; determining a hole side image length indicative of a projected depth of the hole; and employing the first distance, the optical axis of the light recording apparatus, the hole image position and the hole side image length to calculate the depth of the hole, in combination with the rest of the limitations of the claim.

The dependent Claims 15-18 are allowed by virtue of their dependence upon Claim 14.

The closest reference of Holec (US 6,392,744) computes a distance to a target from a geometrical parameter of the reflected image. However, it does not calculate the depth of a hole by employing the hole image size and the hole size to determine a second distance indicative of a distance between the light recording apparatus and the far side surface of the hole, and then by subtracting the predetermined distance between the light recording apparatus and the surface of the workpiece from the second distance. All other prior art teaches measuring a depth of a hole or a cavity based on

the intensity light analysis, and fails to teach measuring the depth by employing the hole image size and the actual hole size.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Munakata et al disclose an apparatus and method of measuring boundary surface by calculating a ration of the light quantity of different parts of reflected light from a sample. Kakuchi et al discloses a device for measuring depth of a groove by detecting a spectral reflectance detected by two detectors. Ono teaches an image capturing apparatus for obtaining information regarding a depth of a subject by calculating the intensities of outgoing light beams from the subject. Clifford, Jr. Et al discloses an optical system for measuring the depth of the gap by subtracting the known depth of the slot from the measured depth of the cavity, which was determined by correlation peaks of the reflected light beams.

Papers related to this application may be submitted to Technology Center 2800 by facsimile transmission. Papers should be faxed to TC 2877 via the PTO Fax Center located in CP4-4C23. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (November 15, 1989). The CP4 Fax Center number is (703) 872-9306.

If the Applicant wishes to send a Fax dealing with either a Proposed Amendment or for discussion for a phone interview then the fax should:

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a) Contain either the statement "DRAFT" or "PROPOSED AMENDMENT" on the Fax Cover Sheet; and

b) Should be unsigned by the attorney or agent.

This will ensure that it will not be entered into the case and will be forwarded to the examiner as quickly as possible.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to L. G. Lauchman whose telephone number is (571) 272-2418. The examiner's normal work schedule is 8:00am to 4:30pm (EST), Monday through Friday. If attempts to reach examiner by the telephone are unsuccessful, the examiner's supervisor Gregory J. Toatley, Jr. can be reached on (571) 272-2059, ext. 77.

Any inquiry of a general nature or relating to the status of this application should be directed to the TC receptionist whose telephone number is (571) 272-1562.

A handwritten signature in black ink, appearing to read 'L. G. Lauchman', with a long horizontal flourish extending to the right.

L. G. Lauchman
Patent Examiner
Art Unit 2877

November 23, 2004